Sept. 23, 1941. L. S. ROBERTS 2,256,581

MECHANICAL COUNTER

Filed June 10, 1940 2 Sheets-Sheet 1

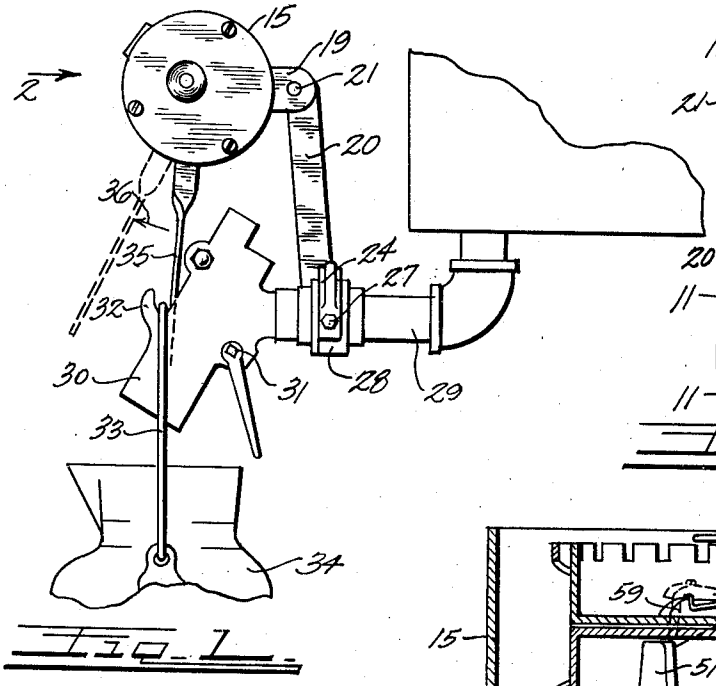


Fig. 1

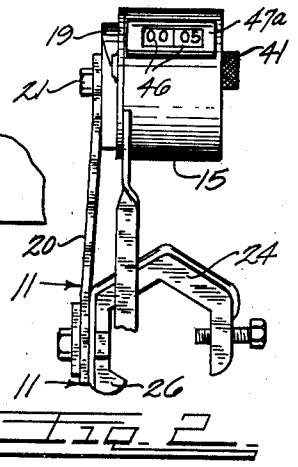


Fig. 2

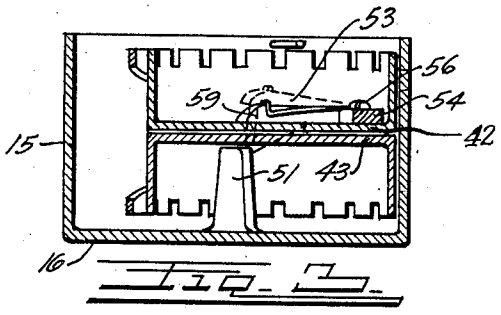


Fig. 3

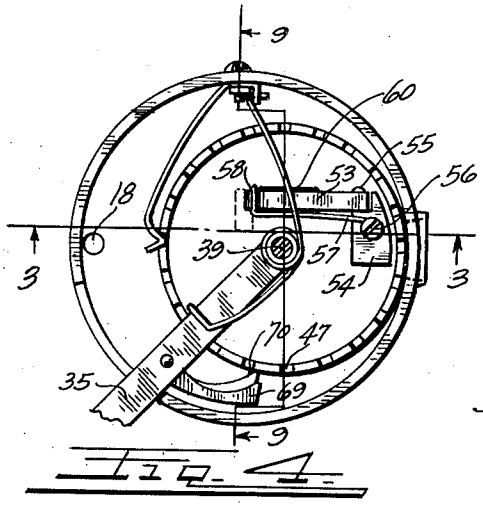


Fig. 4

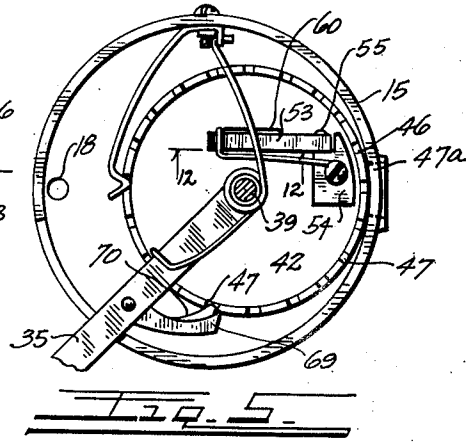


Fig. 5

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Filed June 10, 1940 2 Sheets-Sheet 2

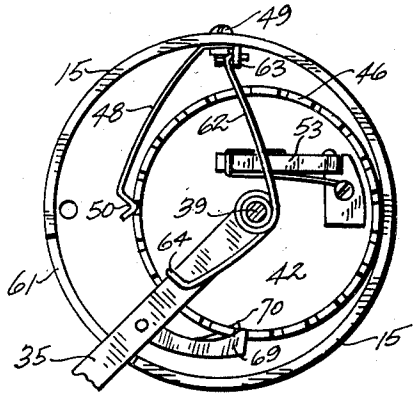


Fig. 6.

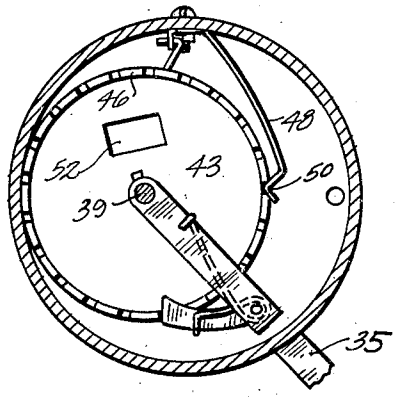


Fig. 7.

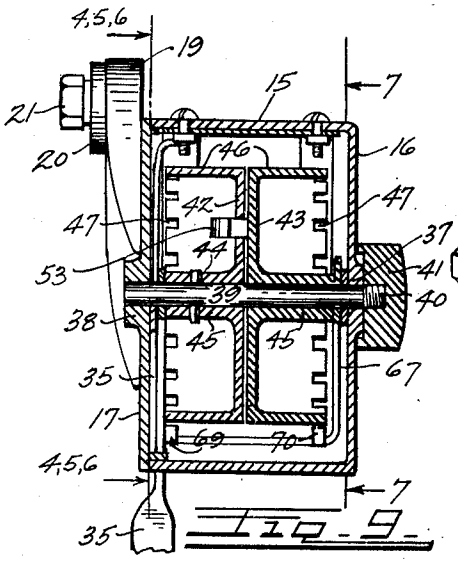


Fig. 9.

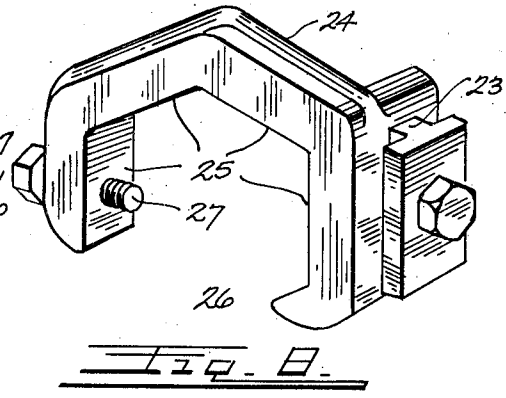


Fig. 8.

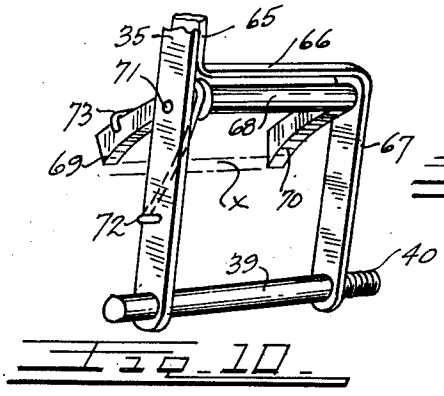


Fig. 10.

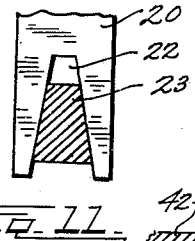


Fig. 11.

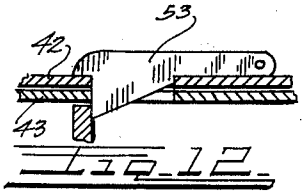


Fig. 12.

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UNITED STATES PATENT OFFICE

2,256,581

MECHANICAL COUNTER

Lloyd S. Roberts, Denver, Colo.

Application June 10, 1940, Serial No. 339,757

1 Claim. (Cl. 235—144)

This invention relates to improvements in mechanical counters and has reference more particularly to a counter or adding machine for use in automatically adding a certain number of successive movements.

In many cases it is necessary to keep accurate count of certain operations and for this purpose various devices have been invented. Where the different operations involve a comparatively few at each time, it is quite common to keep tally by means of a pen and pencil with the result that mistakes frequently occur.

In the dispensing of gasoline, it is quite customary to draw the gasoline from the tank into five-gallon cases and then empty these cans into the customer's container. When gasoline is dispensed in this way, the number of cans are indicated on a tally sheet. It has, however, frequently occurred that errors have been made in this manner and it is one of the objects of this invention to produce a mechanical counter that can be readily attached to gasoline tank wagon in such a way as to automatically register the number of five-gallon cans drawn from the tank.

Although the use indicated is the one that is contemplated as the most important use of the present invention, the invention is in no wise limited to this use and can be employed for many other purposes.

In order to explain this invention so that it can be readily understood, reference will be had to the accompanying drawings in which the invention has been illustrated, and in which:

Figure 1 is a side elevation of a portion of a gasoline tank showing the dispensing valve which is associated therewith and showing also the counter attached to the dispensing valve in operative position;

Figure 2 is a view of the counter and the means for attaching it, looking in the direction of arrow 2 Figure 1, the counter and attaching device being shown detached from the pipe and valve;

Figure 3 is a transverse section taken on line 3—3, Figure 4;

Figures 4, 5 and 6 are views taken on lines indicated by numbers 4, 5 and 6 in Figure 9 and show consecutive positions of the carrying mechanism;

Figure 7 is a section taken on line 7—7, Figure 9;

Figure 8 is a perspective view of the attaching clamp;

Figure 9 is a section taken on line 9—9, Figure 4;

Figure 10 is a perspective view showing the pawl and a portion of the pawl operating handle;

Figure 11 is a section taken on line 11—11, Figure 2; and

Figure 12 is a section taken on line 12—12, Figure 5.

In the drawings reference numeral 15 designates a cylindrical housing of cup-shape, the bottom of the housing being designated by reference numeral 16. The open side of the housing is normally closed by a removable cover 17 that is held in position by means of bolts 18. The cover is provided with an integral lug 19 that extends beyond the periphery of the housing and which is secured to the upper end of a bar 20 by means of a bolt 21. The lower end of bar 20 is provided with a tapering notch 22, which receives a correspondingly shaped lug 23 that is carried by the attaching member 24, which has been shown in perspective in Figure 8. Member 24 is provided with four sides which have been designated by reference numeral 25 and that are arranged to fit a hexagon nut. One of the vertical sides has an inwardly extending projection 26 and the other a set screw 27. This attaching member is clamped to the coupling 28 in the manner indicated in Figure 1 and is intended to remain in place while the counter and bar 20 can be removed and attached thereto at will. An oil truck usually has a plurality of discharge pipes like the one designated by the reference numeral 29 and each pipe has a faucet 30 that has a controlling valve located on the inside thereof. The valve is opened and closed by a detachable handle that can be connected with and removed from the noncircular projection 31. The front side of the faucet has a hook 32 for the reception of the bail 33 of a five-gallon can which has been designated by reference numeral 34. The counter 15 is supported above the faucet in the manner shown in Figure 1 and has a downwardly extending lever 35 that is acted upon by a spring which tends to move the lever in the direction of arrow 36. When the can is attached to the faucet, the lever 35 is pushed rearwardly by the action of the bail so as to assume the position shown, and when the can is removed the lever moves outwardly into the dotted line position. The outward movement of the lever operates the counter in a manner which will be presently described.

The bottom 16 is provided with an eccentrically positioned bearing which has been designated by reference numeral 37 and the cover 17

has a correspondingly positioned bearing 38. A shaft 39 has its ends journalled in the bearings 37 and 38. The end 40 of the shaft projects beyond the bearing 37 and is threaded for the reception of a handwheel 41 by means of which the shaft can be rotated. Supported on the shaft within the housing 15 are two counter elements which are substantial duplicates with the exception of certain minor changes which will be hereinafter pointed out. One of the counter elements has been designated by reference numeral 42 and the other by reference numeral 43.

The counter element 42 is held against rotation on the shaft by means of a pin 44 while the counter element 43 is freely rotatable on the shaft. Each counter element has a central hub 45 and a cylindrical flange 46. The flanges extend outwardly from the center of the housing as shown in Figures 3 and 9. The edges of the flanges are provided with equally spaced notches 47 and in the present embodiment there are twenty notches in each flange. It will be seen from the drawings that the shaft 39 is eccentrically positioned with respect to the cylindrical wall of the housing and as a result of this, the flanges 46 are positioned in close proximity to the inner surface of the cylindrical wall of the housing on one side of a diameter and spaced a considerable distance away from the inner surface on the other side. At the point where the flanges 46 approach the inner surface of the cylindrical wall of the housing, there is an opening 47 through which the peripherial surfaces of the flanges can be seen. This opening is shown most clearly in Figure 2. The peripherial surface of the flange 46, which is seen to the right in Figure 2, has painted thereon twenty notches beginning with "00" and varying it by fives, the last number of the series being "95" and the flange 46 to the left in Figure 2 has correspondingly placed numbers beginning with "00" and ending with "19", the separate numbers differing by one unit. Secured to the inner surface of the cylindrical housing are two springs 48 which are held in place by means of screws 49. The ends of the springs are bowed inwardly as indicated by numeral 50 and each spring is positioned to engage with one set of notches. The function of these springs is to hold the counter elements against accidental movement.

Referring now to Figure 3 it will be seen that there is a projection 51 that extends upwardly from the bottom 16 and terminates adjacent the bottom portion of the cup-like counter element 43. This counter element has an opening 52 which is so positioned that it will pass directly over the top of the projection 51 once every revolution of the counter element. Secured to the bottom of the counter element 42 is a pawl 53 that is attached to a base 54 by means of a pivot 55. The base 54 is secured in place by means of a screw 56 which also serves to hold one end of a spring 57 whose free end 58 extends over the top of the pawl 53 and serves to bias the same downwardly towards the bottom of the counter element and cause it to engage counter element 43 as shown in Figure 9. The pawl is provided on its under surface with a downwardly extending projection 59 that extends through the opening 60 and normally rests against the inner surface of element 43 but which will project through the opening 52 in this element when it is positioned to register with the same. When the projection 59 extends through the opening 52, it will engage the projection 51 and serve to stop the rotation of the parts at a predetermined position. Since the pawl 53 is attached to the counter element 42 that is held against rotation with respect to the shaft 39 by means of the pin 44, it can be turned relative to the counter element 43 by means of the handwheel 41 and when it is rotated in a counterclockwise direction, when viewed as in Figures 4 and 5, it will first project through the opening 52 when it reaches the same and will then move the counter element 43 until the projection 59 engages the stop 51 whereupon further rotation will be prevented. When the projection 59 engages the stop 51, and two counter elements are so positioned that the double zeroes on their outer surfaces will be visible through the opening 47.

In order to operate the counter a lever 35 has one end pivoted to the shaft 39 and extends through a notch 61 in the cylindrical wall of the housing. A spring 62 has a portion encircling the shaft and has one end anchored at 63 and the other end 64 engaging over the lever in the manner shown in Figure 6. The spring is tensioned so as to normally hold the lever against the lower end of the notch 61 when viewed as in Figures 4, 5 and 6.

Referring now to Figure 10, it will be seen that there is attached to the lever 35 a flat bar 65 that has a portion 66 extending at right angles and turned downwardly so as to provide a part 67 that is parallel with the inner end of lever 35. The part 67 is provided with an opening for the reception of the shaft 39. The distance between the lever and the part 67 is sufficient to receive the two counter elements 42 and 43. A double pawl comprising a tubular cylindrical part 68 and two pawls 69 and 70 integrally connected therewith, is positioned between the lever 33 and the arm 67 and held in position by means of a pintle 71. A spring having one end 72 engaging the lever 35 extends upwardly and encircles the pintle 71 and has its other end 73 engaging the upper surface of pawl 69. The spring is tensioned so as to bias the two pawls downwardly when viewed as in Figure 10. The end of pawl 70 extends somewhat farther down than the corresponding end of pawl 69 and in Figure 10 this distance has been designate by reference character "x." When the parts are in assembled relation, pawl 70 is positioned over the notches in the flange of counter element 43 and pawl 69 is positioned over the notches in the flange of counter element 42. The notches in the flange of counter element 43 are of such size with respect to the pawl 70 that the latter can engage the notches without rotating inwardly a sufficient distance to permit the pawl 69 to engage the notches in counter element 42. When the lever 35 is moved upwardly when viewed as in Figures 4 to 6, it increases the tension of spring 62 and when the force is removed from lever 35, spring 62 moves it downwardly against the lower end of the notch. During the downward movement of lever 35, pawl 70 moves the counter element 43 one-twentieth of a circumference, or eighteen degrees. Since in this present mechanism the counter element 42 moves one notch to every complete revolution of the counter element 43. One of the notches 47 in the latter is made larger than the others and when the pawl 70 drops into this large notch, the two pawls rotate sufficiently to permit pawl 69 to engage one of the notches 47 in counter element 43

with the result that when the lever is moved towards the lower end of the notch, when viewed as in Figure 6, the counter element **42** will be stepped ahead eighteen degrees. If counter element **42** is to be stepped ahead each time the counter element **43** has moved ten notches instead of twenty, it will be necessary to have two large notches **47** in the flange of element **43**.

Referring now to Figures 4, 5 and 6, it will be observed that when the pawl **70** rests on the material between the notches **47** in the corresponding counter element, the pawl **69** will be held some distance away from the outer surface of counter element **42** and when the pawl **70** drops into a notch **47** of the ordinary size, the pawl **69** will still clear the outer surface of counter element **42**, but when the pawl **70** drops into the large notch provided for this purpose, the pawl **69** will drop into the corresponding notch in counter element **42** and when this occurs both of the counter elements will move simultaneously through the same angle.

At the end of each operation, when it is desired to set the counter back to zero, the operator grasps the handwheel **41** and rotates the same, whereupon the pawl **53** will project through the opening **52** and interconnect the two counter elements which will then move simultaneously until the pawl engages the stop **51**, whereupon the movement will cease and at which point the two double zeroes will be visible through the opening **47***a*. When the lever **35** is reciprocated, it will first rotate the counter element **43** and this will resist the pawl from the full line to the dotted line position shown in Figure 3.

Having described the invention what is claimed as new is:

A counter comprising in combination, a housing, bearings on opposite sides thereof, a shaft extending through the housing with its ends journaled in the bearings, a pair of counter elements positioned in the housing and supported by the shaft, a projection extending inwardly from one side of the housing wall, the counter element adjacent the projection having an opening, a pawl movably attached to the other counter element in position to project through the opening and engage the stop when the two counter elements are in a predetermined position, the counter element which carries the pawl being nonrotatably attached to the shaft, and means positioned outside of the housing for rotating the shaft to bring the pawl into engagement with the stop.

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